Editorial

Dues Will Be Twelve Dollars

EFFECTIVE next January first, membership dues will be twelve dollars a year, an increase of two dollars. This action by the Board of Directors, the first of its kind in many years, has been necessary in order to maintain the present fine JOURNAL, improved publication practices, and efficient office management. These improvements, which have already greatly enhanced the prestige of the Society and its value to the membership, are the direct consequence of wishes of the membership as expressed in replies to the 1947 questionnaire on management policies. The results of this poll were summarized in the JOURNAL for February 1948.

The rising costs of recent years have forced all technical societies to increase membership rates and by amounts which are in most instances far greater than found to be necessary by this Society. Moreover a review of the present situation reveals that, since the establishment of the JOURNAL nearly three years ago, our members have been receiving more for their ten dollars dues than ever before. All discussion of technical papers is now published in the JOURNAL which contains many other added features. Formerly it was necessary to subscribe also to the TRANSACTIONS at a cost of four dollars to get the printed discussion, thus making a total cost of fourteen dollars for the technical information supplied at present for ten dollars. The Society will continue to offer what amounts to a binding service for those who desire an annual bound copy of the JOURNAL. The price has not been set at this writing, but probably will be about three dollars to members and subscribers, less than charged formerly for the TRANSACTIONS.

With the new dues structure, income will be more favorably related to costs. The response to the questionnaire mentioned above showed that a nominal dues increase would be acceptable to the members if the improvements they requested were forthcoming. The improvements demanded have been accomplished at minimum cost to members and maximum advantage to the Society.

CHARLES L. FAUST

New Creations

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An outstanding development for stripping defective electroplated nickel, copper, silver, cadmium and zinc from steel. Fast action . . . no basis metal attack. The highly polished grill cover illustrated has been completely stripped of nickelplate, and is *ready for replating without repolishing.*

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The Ultraviolet Method of Continuous Gas Analysis

L. G. Glasser[1]

ABSTRACT

Ultraviolet radiation absorption measurement has been used for some time for the determination of the concentrations of absorbing gases. Instruments have been constructed for spot reading or continuous recording of the concentration of one component of a mixture. Only a few instruments are commercially available for continuous analysis of atmospheric contamination in order to control noxious or explosive vapors, and for analysis and control of chemical process streams. Widespread use of continuous ultraviolet gas analyzers will not come until certain difficult problems are solved. These problems are: (*a*) high sensitivity to small absorptions must be achieved as well as long- and short-time stability of a high degree; (*b*) the interference due to sample gas components that absorb ultraviolet radiation, in addition to the component, whose concentration it is desired to determine, introduces inaccuracies; and (*c*) the presence of dust, condensables, and corrosive materials in the sample gas and in the ambient air reduces the accuracy and mechanical reliability of the analyzer.

INTRODUCTION

New types of high-speed, continuous chemical processes require instruments and apparatus that will rapidly and continuously analyze and control such processes. Furthermore, the safe and economical operation of many chemical processes demands that the concentrations of toxic and explosive gases be accurately known at all times. It is dangerous to allow the concentrations of toxic and noxious gases to get too high, and it is frequently uneconomical or impossible to eliminate them completely. Process control based on determination of component concentrations by analytical laboratory techniques is slow and costly in some cases compared to that which may be accomplished with continuous recording gas analyzers.

Various types of gas analyzers are now available for continuous, high-speed analysis and process control. The operation of these is based on measurements of variables such as thermal conductivity, heat of combustion, density, paramagnetism, pH, fluorescence, and absorption of infrared and ultraviolet radiation.

Manually operated ultraviolet gas analyzers available commercially for portable use and spot checks of gas concentration in flowing samples include the M.S.A. (Mine Safety Appliances Company) analyzer for solvent and other vapors (10), the G.E. (General Electric) mercury vapor detector (39), and the Beckman chlorine analyzer (20). Each of these may readily be made recording. Available recording analyzers include the Beckman Model DUR spectrophotometer (23, 24), and the spectrophotometer developed by H. Cary (3) and manufactured by the Applied Physics Corporation. The portable analyzers have extremely high sensitivity, and the spectrophotometers have complete versatility of wavelength. Each of these analyzers is limited in its applicability, however, most of them having been built for special applications. Additional analyzers, both manual and automatic, are described in the literature. Among the analyzers that have been described several were specifically built, or appear to be operable, for the analysis of the concentration of one component of a flowing gas. Others were built for use on liquids and other sample materials, but it appears possible with minor modifications to use them for the analysis of one component of a flowing gas. Several of these are continuous-recording:

Carbon disulfide vapor (5, 27)
Chemical warfare gases (16)
Chlorine in water (4)
Miscellaneous applications (1, 2, 7, 12, 21, 26, 28, 29, 36, 37)
Naphthalene (6, 9)
Nitric oxide and nitrogen dioxide (18)
Oxygen in air (11, 38)
Oxygen in water (22, 32)
Ozone (34)
Styrene in butadiene (14, 24)
Vitamin A (8, 19, 33)

When each of these analyzers is considered as a possible general design for use in a variety of continuous process control applications, limitations appear to make general application impractical. It is the purpose of this paper to describe the ultraviolet method of continuous gas analysis and to point out the more important design and performance requirements of versatile, continuous, automatic gas analyzers for industrial applications.

METHOD OF ANALYSIS

The method of ultraviolet radiation absorption measurement is applicable to many gases that cannot be determined as readily or as accurately by other methods. There are many gases and vapors that have absorption bands in the ultraviolet spectrum, and hence their concentrations may be determined by ultraviolet spectroscopic techniques. Representative gases and vapors that absorb ultraviolet radiations of wavelengths longer than 250 mμ are listed in Table I.

Gases and vapors which do not appreciably absorb ultraviolet radiation of wavelengths longer than 250 mμ are listed in Table II.

[1] Engineering Research Laboratory, Engineering Department, E. I. du Pont de Nemours & Company, Inc., Wilmington, Delaware. This paper presented at the Cleveland Meeting of the Society, April 19 to 22, 1950.

The lists in Tables I and II contain only representative gases; many more materials may be listed in each category.

The principle of ultraviolet absorption analysis can be understood with reference to Fig. 1. This shows that the absorption of radiation by chlorine at any wavelength is a function of the chlorine concentration. Concentrations smaller than 5 per cent by volume certainly can be accurately ascertained at 334 mμ wavelength because of the high strength of the absorption at that wavelength, but would be rather difficult to determine with comparable accuracy at 265 or 405 mμ. Long paths of sample gas may be interposed in the light beam in order to achieve a measurable absorption by a low concentration of gas. The relation governing this absorption is the Lambert-Beer Law:

$$\log_{10} 1/T = kcd \qquad (I)$$

where T = transmittance ($T = 1 -$ absorption), k = extinction coefficient, which depends on the gas and the wavelength, c = molecular concentration of the gas, and d = sample path length, or cell length. Thus, gas concentration may be determined, when k is known, by measurement of the absorption or transmittance of the gas in a cell of length d. Values of k may be found in the literature (13, 17), or they may be readily determined if the concentration is accurately known by other means.

TABLE I. *Ultraviolet-absorbing gases and vapors*

acetone	naphthalene
benzene	nitrogen dioxide
β-naphthol	nitrogen tetroxide
bromine	nitrobenzene
carbon disulfide	ozone
chlorine	perchloroethylene
dichlorophenol	phenol
ethylbenzene	phosgene
formaldehyde	sulfur dioxide
gasoline	tetraethyllead
hydrogen peroxide	toluene
hydrogen sulfide	trichlorethylene
iodine	vinyl acetylene
mercury	xylene

TABLE II. *Nonultraviolet-absorbing gases and vapors*

ammonia	methanol
amyl alcohol	methyl chloride
butane	methylene chloride
ethane	nitrogen
ethanol	nitric oxide
ethylene dichloride	oxygen (air)
ethyl ether	sulfur trioxide
hexane	tetrachloroethane
hydrogen chloride	vinyl chloride
methane	water vapor

CONSTRUCTION OF AN ULTRAVIOLET ANALYZER

Some considerations in the design of double-beam analyzers for industrial control were presented in a recent paper (15) that described alternate designs, most of which employed a single detector and a light chopping arrangement to permit a-c operation.

An ultraviolet analyzer for industrial use must continuously measure and record accurately the concentration (which is directly related to radiation absorption) of the ultraviolet-absorbing component of the gas. The instrument contains a light source, Fig. 2, that generates the desired ultraviolet wavelength. Available sources, such as mercury, sodium, and hydrogen arcs, and wolfram (tungsten) lamps, generate more than one wavelength of radiation, hence optical filters are needed to screen out the unwanted wavelengths. Analyzers intended for sustained automatic operation contain photometer circuits that comprise either one or two phototubes or photocells. When there is one detector, it views the source alternately through and around a transparent-glass sample cell. In the two-detector design, both detectors continuously or alternately view the light source, one directly and the other through the sample cell. When the sample cell contains a nonabsorber, such as air, the zero of the photometer is set, i.e., the outputs of the two detectors are equalized. The instrument may be calibrated in concentration units by passing known concentrations of sample gas through the cell, or by other related methods. In sustained operation the calibration must be checked periodically, in order to avoid errors due to drifts in the sensitivity of the detector, and from other sources. The operation of a two-detector analyzer that is optically null-balanced is shown schematically in Fig. 2 and 3.

Sensitivity of Analysis

The detection sensitivity of an ultraviolet analyzer for chlorine gas depends on the wavelength of light employed, the length of the cell through which the gas flows, and the sensitivity of the photometric circuit used in the analyzer. An analyzer that will detect 1 per cent light absorption in a ½-in. cell at 334 mμ wavelength would detect 0.1 per cent of chlorine by volume in air. As little as 0.01 per cent chlorine could be detected with a 5-in. long cell, and still smaller amounts could be detected with a more sensitive photometric circuit. A portable, two-detector analyzer developed by Hanson (10) and available in modified form as the M.S.A. analyzer operates at wavelength 254 mμ. It will detect about 0.001 per cent light absorption by a sample gas in its 5-in. cell. In spite of the low extinction coefficient or low degree of absorption of chlorine at this wavelength, the M.S.A. analyzer can detect about 0.004 per cent (40 ppm) by volume of chlorine.

In order to achieve high sensitivity an analyzer may have long sample cells. Short cells are more convenient and less costly, and if long cells are not essential to attaining the desired sensitivity, short cells are preferred. Very long cells are impractical in most cases because dust, mist, and interfering gases in the gas sample to be analyzed present spurious absorptions that are proportional to the cell length, thus reducing the accuracy of analysis. Cells much shorter than ¼ in. might be difficult to assemble to exactly the same length each time without special jigs and fixtures.

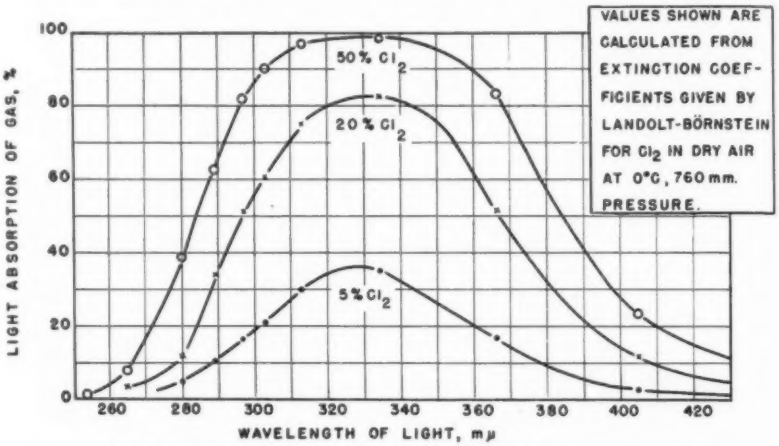

FIG. 1. Variation of absorption with wavelength for chlorine, cell length: ½ in.

In order to have maximum applicability for automatic, continuous chemical analysis, analyzers need to have readily adjustable sensitivity. A choice of wavelengths affords some variation of sensitivity, and it has the added advantage that a wavelength may be selected at which the only absorbing component is the one whose concentration it is desired to measure. The interference-free wavelength may not be that wavelength at which just the right sensitivity is available, and hence other ways to vary the sensitivity are needed. Practical limitations on cell length limit the sensitivity variation that is available this way to about 1:40 i.e., with a cell length of $\frac{1}{4}$ to 10 in. A third way to vary analyzer sensitivity is to vary the photometric sensitivity directly. The more sensitive analyzers have used differential photometers that measure light absorption only over a narrow range. By measuring differentially, these analyzers achieve a high sensitivity that can be varied by switching to the various scales of a multirange voltmeter or microammeter in the analyzer output circuit, or, in some cases, by adjusting the range of light-balancing devices.

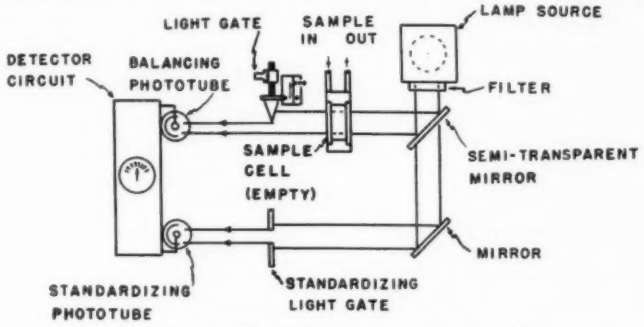

FIG. 2. Ultraviolet gas analyzer (no sample).

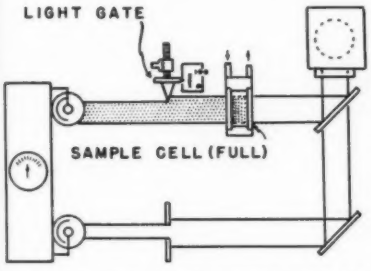

FIG. 3. Ultraviolet gas analyzer (with sample).

Factors Affecting Accuracy

The type of analyzer required by the chemical industry must have a long life, and it must continuously provide accurate analyses with a minimum of operator attention and maintenance. Completely automatic operation is essential, for frequently when an operator or mechanic has to adjust or service the instrument, there is an opportunity for introducing inaccuracies and for damaging the instrument. For example, an analyzer for chlorine becomes corroded when it is opened for servicing, because traces of corrosive gas from the ambient air get into the instrument. Thus, not only is careful design essential in order to withstand the rigors of plant use, but careful selection of materials of construction is also important. Moving parts should be avoided wherever possible, and when they are unavoidable, they should have high chemical stability in the solvent and corrosive vapors that are frequently encountered in chemical plants.

The sensitivity of analyzers of this type should not only be high and adjustable, but it should remain constant for years and should be the same in all instruments of the same design. Many of the analyzers that have been built have a sensitivity that depends on the lamp and phototube supply voltages, on the age of many of the components, and on the cleanliness of the cell windows. Some photometer circuits, including many of those that employ two photocells or two phototubes in a bridge circuit, are not compensated for supply voltage changes and will show large spurious concentration indications. Such circuits may also show spurious readings due to changes in photometer light source intensity, or through phototube aging. Ultraviolet mercury lamps decline in output with use and the ends of the lamps darken due to condensation of filament material on the inside of the glass lamp envelope. Phototubes may change sensitivity with age even when operated carefully. The biggest sensitivity changes are due to the tubes becoming gassy through minute leaks. Combinations of light filters that are used to isolate single wavelengths of mercury lamp radiations may change their optical characteristics (solarize and fade), particularly in the presence of strong ultraviolet radiations. These are not serious limitations in analyzers that are intended for short-use periods, as in scouting tests and research work, but they are undesirable in continuous process control equipment. All these effects that introduce spurious readings should be eliminated from an automatic analyzer that is to have general usefulness for continuous process control.

Many process gases contain small amounts of dust and condensable vapors. These, in time, accumulate in absorbing and light-scattering layers on the sample-cell windows, and unless special precautions are taken, they result in spurious concentration readings. The effect of window darkening may be minimized by employing a sample cell in each of the two light beams of

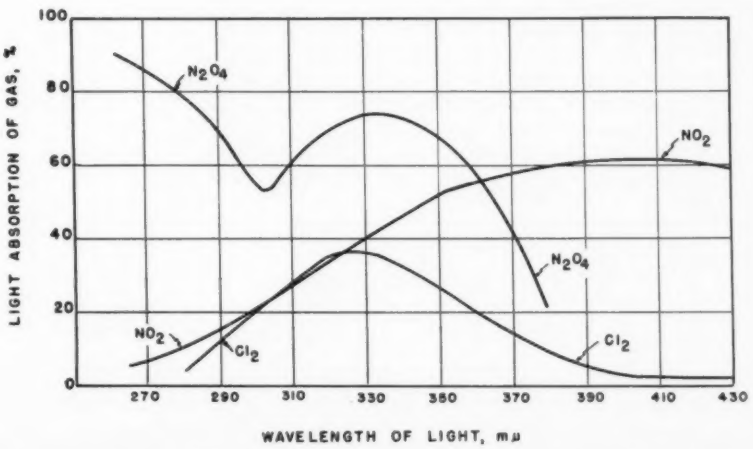

FIG. 4. Variation of absorption with wavelength, cell length: $\frac{1}{2}$ in. Gas concentrations, 5 per cent chlorine and 5 per cent nitrogen peroxide by volume in air at 20°C.

the analyzer as described by Gumaer (9). The length of one section of the cell is considerably longer than the other so that the analyzer can detect the difference in absorption between the two sections. Of course, the photometric circuit has to be a type that is insensitive to equal darkening in each light beam.

If the rate of window fouling is not too high, it may be adequate to standardize the instrument automatically at infrequent intervals. Standardization comprises setting the instrument zero and sensitivity to correct values. By proper design, standardization may be made to compensate electrical, thermal, and other long-time drifts of the analyzer as well as window fouling. Thus, careful standardization in some cases will obviate the need for precision control of analyzer temperature.

Interference

A factor that appears to limit seriously the widespread use of ultraviolet analyzers is interference. An interfering gas is one which absorbs at the same wavelength as the gas whose analysis is desired. Relatively few gases absorb visible light, and more and more gases are found to absorb at shorter and shorter wavelengths in the ultraviolet. Thus, for greatest specificity, the wavelength used for analysis usually should be as long as possible. Chlorine concentration might be determined by using light in the violet end of the visible spectrum (Fig. 1). Similarly, visible light might be used to analyze for nitrogen dioxide, as may be seen from Fig. 4. A longer wavelength would have to be used for nitrogen dioxide in the presence of chlorine. If a sample gas that is to be analyzed for chlorine content also contains nitrogen dioxide, then there is a serious interference; the nitrogen dioxide strongly absorbs all the wavelengths that the chlorine absorbs. Thus, the simple, single-wavelength photometer is not applicable. A method of continuous analysis in the ultraviolet for one component in the presence of one or more interferences involves the measurement of absorption at more than one wavelength (1, 6, 25, 30, 31, 35).

CONCLUSIONS

The ultraviolet method of continuous gas analysis has already proved useful in various industrial applications. Several automatic recording ultraviolet analyzers have been developed for specific applications and successfully employed, and a few commercial instruments have appeared. A need still exists for a versatile analyzer that can be readily adapted to many applications.

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DISCUSSION OF TECHNICAL PAPERS

To appear in the semi-annual Discussion Section of the Journal, written discussion of papers will be accepted up to two months following publication of a paper. Written discussion should be sent in duplicate to the Editor of the Journal, 235 West 102 Street, New York, N. Y.

Current Affairs

Buffalo Meeting—October 11, 12, and 13, 1950

Final arrangements have been made for the ninety-eighth meeting of the Society, to be held in Buffalo, New York, October 11th, 12th, and 13th, at the Statler Hotel, and the program offered is of unusual scope and interest to the members.

The registration desk will be open Tuesday afternoon for the convenience of early arrivals. The meeting will be concluded with the Friday evening program; there will be no Saturday sessions.

In addition to a technical program including over seventy papers, a full schedule of luncheons and dinners has been planned. On Wednesday, October 11th, a cocktail party at 6:30 P.M. will be followed by an informal dinner at 7:30 P.M. Through the courtesy of the Niagara-Mohawk Power Company, the speaker at the dinner will be Mr. A. T. O'Neil. Mr. O'Neil, Vice-President of the Niagara-Mohawk Power Company, will speak on "The Present and Future Power Prospects in the Niagara Frontier," a timely subject of interest to power users of the United States and Canada. Entertainment, including a show by the Niagara Falls Little Theater and a square dance, will follow the dinner.

Mr. Howard Daly of the Norton Company, Niagara Falls, will speak at a luncheon on Thursday, October 12th, in honor of our late Past-President Raymond R. Ridgway.

The Acheson Medal Banquet will be held Thursday evening. At this time, the Edward Goodrich Acheson Medal and Prize will be awarded to Dr. George W. Vinal for his distinguished contributions to the science of electrochemistry. The Medal and Prize will be presented by President Charles L. Faust. Dr. E. U. Condon, Director of the National Bureau of Standards, will give a talk on Dr. Vinal's scientific accomplishments, and Dr. Marion Eppley, President of The Eppley Laboratories, Inc., will speak on the personal traits of the medalist. Dr. Vinal will respond with the Medalist's Address. After the banquet, a musical program will be presented by the Guido Chorus of Buffalo.

On Friday, October 13th, the following Divisions have planned luncheons: Battery, Electrodeposition, Electro-Organic, and Electrothermic. Friday evening, an informal reception will be held at the Red Coach Inn, Niagara Falls.

A complete Ladies' Program has been scheduled, including an informal tea Wednesday afternoon, a trip and luncheon Thursday morning, and a party at the Buffalo Country Club Friday afternoon.

The extensive Plant Trip Program will offer the following visits:

Thursday Afternoon: Gould-National Batteries Incorporated; Westinghouse Electric Corporation motor assembly plant; and Lionite Abrasives, Ltd., new silicon carbide plant.

Friday Afternoon: Buffalo Electro-Chemical Company installation of the contact rectifier and Huntley Station steam electric generating plant; Colonial Radio Corporation electronic equipment plant; and E. I. du Pont de Nemours viscose plants producing rayon, cellophane, and sponge.

Technical Program

Electrothermic Round Tables

Wednesday, October 11, 1950

Electric Furnaces for Nonferrous Metals

G. K. Dreher, Moderator

9:30 A.M.–12:30 P.M.—The panel members will be:

B. W. Schafer, Manager, Detroit Electric Furnace Division, Kuhlman Electric Company, Bay City, Mich.

H. Russell Ogden, Jr., Battelle Memorial Institute, Columbus, Ohio.

Manuel Tama, Vice-President, Ajax Engineering Corporation, Trenton, N. J.

Frank T. Chesnut, Treasurer, Ajax Electrothermic Corporation, Trenton, N. J.

J. G. Thompson, Chief, Division of Metallurgy, National Bureau of Standards, Washington, D. C.

G. K. Dreher, Executive Director of Foundry Educational Foundation, Cleveland, Ohio.

R. L. Harper, Harper Electric Furnace Company, Niagara Falls, N. Y.

B. N. Ames, Metallurgist, Materials Research Laboratory, Brooklyn Navy Yard, Brooklyn, N. Y.

H. M. Webber, Electric Furnace Section, Industrial Heating Division, General Electric Company, Schenectady, N. Y.

Subjects to be discussed will include: indirect-arc rocking-type furnace, low frequency induction furnaces, high frequency induction furnaces, indirect-arc and resistor furnaces in sand cast and investment foundry operations, and controlled atmosphere furnaces in brazing and sintering metals.

Electric Furnaces in the Processing of Nonmetals

G. J. Easter, Moderator

2:00 P.M.–5:00 P.M.—The panel members will be:

R. B. Burt, in charge chemical plant control, Electric Furnace Plant, TVA, Wilson Dam, Ala.

M. M. Striplin, Jr., Development Section, TVA, Wilson Dam, Ala.

Robert MacDonald, Jr., Vice-President, General Abrasive Company, Niagara Falls, N. Y.

R. A. Webber, Works Manager, Electro Refractories & Alloys Corpora-

tion, Trois Rivieres, Quebec, Canada.

M. J. Udy, Consultant, Niagara Falls, N. Y.

Hewitt Wilson, Regional Director, Bureau of Mines, Norris, Tenn.

R. L. Harper, Harper Electric Furnace Company, Niagara Falls, N. Y.

J. A. Shaw, Technical Advisor, International Graphite and Electrode Corporation, Niagara Falls, N. Y.

Subjects to be discussed will include: phosphate production, silicon carbide, fused alumina, graphite and carbon, phosphorous, and electric furnacing of ceramic products.

Corrosion

Wednesday, October 11, 1950

Theoretical Aspects of Corrosion

I. A. Denison, presiding

9:20 A.M.—Introductory remarks.

9:30 A.M.—"Bi-metallic Corrosion in Neutral Electrolytes—A Critical Review" by Roman T. Koenig and Carl W. Borgmann, University of Nebraska, Lincoln, Nebr.

10:00 A.M.—"The Kinetics of the Oxidation of Cobalt" by Earl A. Gulbransen and Kenneth F. Andrew, Westinghouse Research Laboratories, East Pittsburgh, Pa.

10:30 A.M.—"Experiments Concerning the Mechanism of Corrosion Inhibition by Inorganic Anions" by W. D. Robertson, Hammond Metallurgical Laboratory, Yale University, New Haven, Conn.

11:00 A.M.—"Contribution to the Theory of Cathodic Protection" by Carl Wagner, Department of Metallurgy, Massachusetts Institute of Technology, Cambridge, Mass.

11:30 A.M.—"Effect of Magnetic Transformation at the Curie Temperature on Oxidation Rates of Chromium-Iron Alloys" by H. H. Uhlig and Anton de S. Brasunas, Department of Metallurgy, Massachusetts Institute of Technology, Cambridge, Mass.

12:00 A.M.—"The Mechanism of Exchange between Radioactive Ions in Solution and Solid Metals" by M. T. Simnad and R. C. Ruder, Metals Research Laboratory, Carnegie Institute of Technology, Pittsburgh, Pa.

Electrical Measurements in Corrosion

2:00 P.M.—"The Kinetics of the Initial Corrosion of Copper in Aqueous Solution" by George Richard Hill, University of Utah, Salt Lake City, Utah.

2:30 P.M.—"Potential-pH Diagrams and their Applications to the Study of Metallic Corrosion—Aluminum, Lead, Silver, and Zinc" by Paul Delahay, Louisiana State University, Baton Rouge, La.; Marcel Pourbaix, University of Brussels, Brussels, Belgium; and Pierre Van Rysselberghe, University of Oregon, Eugene, Ore.

3:10 P.M.—"A Polarographic Method for the Indirect Determination of Polarization Curves for Oxygen Reduction on Various Metals" by Paul Delahay, Louisiana State University, Baton Rouge, La.

3:30 P.M.—"On the Application of Bridge Techniques to the Overvoltage Problem" by David C. Grahame, Amherst College, Amherst, Mass.

4:00 P.M.—"Studies on Galvanic Couples, III—Polarization and Cathodic Protection" by H. D. Holler, National Bureau of Standards, Washington, D. C.

4:30 P.M.—"Studies of Time-Potential Changes on an Electrode Surface during Current Interruption, I—Zinc-Steel Couple in Synthetic Sea Water" by Sigmund Schuldiner and Roger E. White, Naval Research Laboratory, Washington, D. C.

Note: A paper, "The Mechanism of the Inhibition of the Corrosion of Iron by Solutions of Sodium Phosphate," by M. J. Pryor and M. Cohen, National Research Council, Ottawa, Canada, will be presented during this session. The exact time of presentation has not been scheduled.

Thursday, October 12, 1950

Corrosion in Solutions

9:00 A.M.—"Dichromate Reduction Rate at a Steel Surface in Air-Free, Acetic Acid Solution" by Norman Hackerman and Ray M. Hurd, University of Texas, Austin, Tex.

9:25 A.M.—"Rate of Dissolution of Silver in Aqueous Ceric Sulfate Solutions" by H. W. Salzberg, H. K. Knoetgen, and H. M. Molless, Hunter College, New York, N. Y.

9:50 A.M.—"The Rate of Corrosion of Silver in Solutions of Ferric Sulfate" by H. W. Salzberg and Cecil V. King, New York University, New York, N. Y.

10:15 A.M.—"The Electrochemical Behavior of Aluminum, II—In Solutions of Iron Sulfate" by J. V. Petrocelli, The Patent Button Company, Waterbury, Conn.

10:40 A.M.—"Corrosion Rate and Etch Structures of Aluminum; Effect of Heat Treatment and Impurities" by B. Roald and M. A. Streicher, Lehigh University, Bethlehem, Pa.

10:55 A.M.—"The Influence of Surface Active Agents on Pickling Brittleness in Carbon and Stainless Steel" by Carl A. Zapffe and M. Eleanor Haslem, 6410 Murray Hill Road, Baltimore, Md.

11:20 A.M.—"Metal-Solution Potentials of Nickel in Foreign Ion Solutions and the Mechanism of Nickel Corrosion" by D. MacGillavry and J. H. Rosenbaum, Clark University, Worcester, Mass.

Electro-Organic Chemistry

C. A. Crowley, presiding

11:40 A.M.—"Electrochemical Reduction of Nitroalkanes" by Morton W. Leeds, Schwarz Laboratories, New York, N. Y., and G. B. L. Smith, Research Department, U. S. Naval Ordnance Test Station, Inyokern, Calif.

12:05 A.M.—"The Electrolytic Reduction of Salicylic and Acetylsalicylic Acids to the Corresponding Aldehydes" by James A. May, The Dow Chemical Company, Freeport, Tex., and Kenneth A. Kobe, University of Texas, Austin, Tex.

Batteries

Thursday, October 12, 1950

Primary Cells

J. N. Mrgudich, presiding

9:00 A.M.—"The Mechanism of the Discharge of the Manganese Dioxide Electrode" by D. Thomas Ferrell, Jr., and W. C. Vosburgh, Duke University, Durham, N. C.

9:30 A.M.—"The Mechanism of the Self-Discharge of Cells with Manganese Dioxide Electrodes" by Charles W. Jennings and W. C. Vosburgh, Duke University, Durham, N. C.

10:00 A.M.—"Distribution of Current in Porous Electrodes" by J. J. Coleman, Burgess Battery Company, Freeport, Ill.

10:30 A.M.—"Miniature High Capacity R-M Cells" by Richard Clune, P. R. Mallory & Company, Inc., Indianapolis, Ind.

11:00 A.M.—"Silver Permanganate and Persulfate as Depolarizers in Primary Batteries" by Paul L. Howard, National Bureau of Standards, Washington, D. C.

11:30 A.M.—"Magnesium Dry Cells" by R. C. Kirk, D. F. George, and

A. B. Fry, Dow Chemical Company, Midland, Mich.

Primary Cells

George W. Heise, presiding

2:00 P.M.—"Calcium Chloride Low Temperature Dry Cells" by Earl Otto and Harold J. DeWane, National Bureau of Standards, Washington, D. C.

2:30 P.M.—"Discharge Characteristics of Leclanché Dry Cells" by John J. Murphy, Signal Corps Engineering Laboratories, Fort Monmouth, N. J.

2:55 P.M.—"Empirical Equation for the Determination of Dry Cell Capacities at 70°F" by Charles H. Clark, Signal Corps Engineering Laboratories, Fort Monmouth, N. J.

3:20 P.M.—"The Electrochemical Evaluation of Manganese Dioxide for Dry Battery Use" by N. C. Cahoon, National Carbon Research Laboratories, Cleveland, Ohio.

3:45 P.M.—"Determination of Volatile Matter in Blacks" by K. Kaufman, Shawinigan Chemicals, Ltd., Shawinigan Falls, Quebec, Canada.

4:10 P.M.—"Nigrometer Readings vs. Particle Size of Blacks" by K. Kaufman, Shawinigan Chemicals, Ltd., Shawinigan Falls, Quebec, Canada.

4:35 P.M.—"S.C.E.L. Primary Battery—Research and Development Program" by Arthur F. Daniel, Signal Corps Engineering Laboratories, Fort Monmouth, N. J.

Friday, October 13, 1950

Secondary Cells

Eugene Willihnganz, presiding

9:00 A.M.—"Battery Loads vs. Battery Performance" by H. C. Riggs, The Electric Storage Battery Company, Philadelphia, Pa.

9:30 A.M.—"Behavior of the Components of Expanders for Lead-Acid Storage Batteries" by A. C. Zachlin, Willard Storage Battery Company, Cleveland, Ohio.

10:00 A.M.—"Practical Appraisal of Addition Agent in Negative Plates of Lead Storage Batteries" by D. H. Haskell, W. P. Fuller & Company, South San Francisco, Calif.

10:30 A.M.—"Addition Agents for Negative Plates of Lead-Acid Storage Batteries, II—Pure Organic Compounds" by E. J. Ritchie, Eagle-Picher Company, Joplin, Mo.

11:00 A.M.—"The Effect of Magnesium Sulfate and Sodium Sulfate on Lead-Acid Batteries" by Paul L. Howard and G. W. Vinal, National Bureau of Standards, Washington, D. C.

11:30 A.M.—"Storage Battery 'Dopes'" by C. C. Rose, Willard Storage Battery Company, Cleveland, Ohio.

2:00 P.M.—"The Effect of Pig-Lead Composition on the Life and Capacity of Lead Batteries" by D. H. Haskell, W. P. Fuller & Company, South San Francisco, Calif.

2:25 P.M.—"The Constant Potential Anodization of Lead in Sulfuric Acid Solutions" by John J. Lander, Naval Research Laboratory, Washington, D. C.

2:50 P.M.—"Some Preliminary Studies of Positive Grid Corrosion in the Lead-Acid Cell" by John J. Lander, Naval Research Laboratory, Washington, D. C.

3:15 P.M.—"Construction and Performance of Plastic Container Electrolyte-Retaining Lead-Acid Batteries" by C. H. Endress and C. C. Rose, Willard Storage Battery Company, Cleveland, Ohio.

3:40 P.M.—"The Hydroset Process for Lead Storage Battery Plates" by R. H. Greenburg, F. B. Finan, and B. Agruss, National Lead Company, Research Laboratories, Brooklyn, N. Y.

4:05 P.M.—"Float Characteristics of Lead Batteries" by U. B. Thomas, Bell Telephone Laboratories, Murray Hill, N. J.

4:30 P.M.—"Nickel-Cadmium Batteries for Military Use" by G. B. Ellis, U. S. Signal Corps Engineering Laboratories, Fort Monmouth, N. J.

Electrodeposition

Thursday, October 12, 1950

Preparation of the Cathode for Plating

R. A. Schaefer, presiding

9:20 A.M.—Introductory remarks.

Adhesion

9:30 A.M.—"Surface Preparation of Nickel Silver, Brass, and Copper for Electroplating" by Daniel Gray, Oneida, Ltd., Oneida, N. Y.

10:00 A.M.—"Cleaning and Etching of Aluminum Alloys" by Walter R. Meyer, Enthone, Inc., New Haven, Conn.

10:30 A.M.—"Diphase Metal Cleaning in Electroplating" by Foster Dee Snell and Irving Reich, Foster D. Snell, Inc., New York, N. Y.

Non-Adhesion

11:00 A.M.—"The Relative Reliability of Aluminum and Zinc Starting Sheets for the Electrodeposition of Zinc" by Glen C. Ware and Kenneth B. Higbie, Bureau of Mines, U. S. Department of the Interior, Albany, Ore.

11:30 A.M.—"Zirconium and Titanium as Cathode Materials for the Electrodeposition of Zinc" by Glen C. Ware and Kenneth B. Higbie, Bureau of Mines, U. S. Department of the Interior, Albany, Ore.

Evaluation of a Clean Cathode

2:00 P.M.—"Water-Break Type Tests for the Evaluation of Metal Cleaning" by S. Spring, Pennsylvania Salt Manufacturing Company, Wyndmoor, Pa.

2:30 P.M.—"The Detection and Estimation of Oils on Metal Surfaces with Ultraviolet Light Procedures" by O. M. Morgan and L. F. Hoyt, National Aniline Division, Allied Chemical & Dye Corporation, New York, N. Y.

3:00 P.M.—"Detection of Soil Removal in Metal Cleaning by the Radioactive Tracer Technique" by J. C. Harris, R. E. Kamp, and W. H. Yanko, Central Research Department, Monsanto Chemical Company, Dayton, Ohio.

3:30 P.M.—"Soil Removal Testing and Cleanliness Evaluation" by A. Mankowich, Aberdeen Proving Ground, Md.

4:00 P.M.—"The Ascyclic Generator for Electrolytic Processing" by Gordon J. Berry, The Electric Products Company, Cleveland, Ohio.

Friday, October 13, 1950

The Cathode or Anode during Electrolytic Processes

R. A. Woofter, presiding

9:00 A.M.—"The Cathode Polarization Potential during the Electrodeposition of Copper. I—The Apparent Instability of Acid Copper Sulfate Solutions and the Production of Solutions of Consistent Characteristics" by L. L. Shreir and J. W. Smith, Bedford College for Women (University of London), London, England.

9:20 A.M.—"Theoretical Analysis of the Current Density Distribution in Galvanic Baths" by Carl Wagner, Department of Metallurgy, Massachusetts Institute of Technology, Cambridge, Mass.

9:45 A.M.—"Plating Experiments with Aqueous Solutions at High Temperatures" by Seymour Senderoff and Abner Brenner, Na-

tional Bureau of Standards, Washington, D. C.

10:10 A.M.—"The Anode Layer in the Electrolytic Polishing of Copper" by H. F. Walton, University of Colorado, Boulder, Colo.

10:35 A.M.—"Studies of Hydrogen Embrittlement in Cadmium Plated Steel" by Robert Weast, Case Institute of Technology, Cleveland, Ohio.

11:00 A.M.—"Mechanism of Mass Transfer in Cathode Films During Electrodeposition" by Robert R. Banks and Henry B. Linford, Columbia University, New York, N. Y.

The Cathode Deposit

11:30 A.M.—"Electrodeposition of Metal Powders" by Gustaf Wranglen, Electrodeposition Section, National Bureau of Standards, Washington, D. C.

11:55 A.M.—"Electrolytic Hexagonal Nickel" by Ling Yang, Frick Chemical Laboratory, Princeton University, Princeton, N. J.

2:00 P.M.—"Improvements in the Electrowinning of Chromium" by R. R. Lloyd, J. B. Rosenbaum, V. E. Homme, L. P. Davis, and C. C. Merrill, Minerals Division, Bureau of Mines, U. S. Department of the Interior, Boulder City, Nev.

2:25 P.M.—"The Effect of Pure Organic Compounds on Crystal Size in Copper Electrodeposition, I." by Martin Chanin, William P. Roth, Herbert R. Roth, and John H. Lane, Evansville College, Evansville, Ind.

2:50 P.M.—"The Effect of Indium in Electrodeposited Chromium" by Norman Hackerman and Tyleen Jensen, University of Texas, Austin, Tex.

3:15 P.M.—"Electrodeposition of Rhenium-Nickel Alloys" by L. E. Netherton, Victor Chemical Company, Chicago Heights, Ill., and M. L. Holt, Chemistry Department, University of Wisconsin, Madison, Wis.

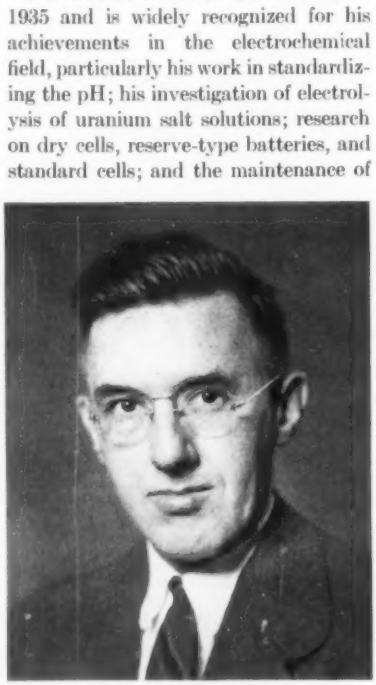
3:40 P.M.—"New Correlative Instrumental Analyses of Textures and Properties of Nickel Electrodepositing" by George L. Clark, University of Illinois, Chicago, Ill., and Stanley H. Simonsen, University of Texas, Austin, Tex.

4:05 P.M.—"Preparation of Fine Wire by Electropolishing" by William H. Colner, Morris Feinleib, and Howard T. Francis, Armour Research Foundation, Illinois Institute of Technology, Chicago, Ill.

Dr. Hamer Heads Electrochemistry at NBS

Dr. Walter J. Hamer has been named chief of the Electrochemistry Section of the National Bureau of Standards, succeeding Dr. George W. Vinal who retired July 1, 1950.

Dr. Hamer came to the Bureau in 1935 and is widely recognized for his achievements in the electrochemical field, particularly his work in standardizing the pH; his investigation of electrolysis of uranium salt solutions; research on dry cells, reserve-type batteries, and standard cells; and the maintenance of our National unit of electromotive force. His many technical papers cover his investigations in these fields.



WALTER J. HAMER

Born in Altoona, Pennsylvania, Dr. Hamer received his B.S. degree from Juniata College and his Ph.D. degree from Yale University. In 1945 he received Certificates of Award from the Office of Scientific Research and Development and from the Manhattan Project. His work on the pH of potassium acid phthalate has been accepted by the British Standards Institution as the primary pH standard of Great Britain. He is a member of the Battery, Corrosion, and Theoretical Electrochemistry Divisions of The Electrochemical Society and holds membership in many leading scientific societies.

NOTICE TO AUTHORS

The deadline for manuscripts or abstracts for the Spring Meeting, to be held in Washington, is *February 1, 1951*. Correspondence should be directed to the Editor of the JOURNAL, 235 West 102nd Street, New York 25, N. Y.

Goetz Chemistry Head at Iowa State

Dr. Charles A. Goetz has been named head of the department of chemistry at Iowa State College and senior scientist at the Institute for atomic research, effective July 1st. He succeeds Dr. R. M. Hixon who has been acting in the dual capacity of chemistry head and dean of the graduate college, and who will continue as graduate dean.

Dr. Goetz came to Iowa State in July, 1948, following two years as director of engineering and development for Brunswick-Balke-Collender Company, and eight years as vice-president in charge of research and development with the Cardox Corporation. His research has been chiefly in analytical chemistry, electrochemistry, and fire extinguishing methods and equipment.

Marden Prize Winner

Lynn George Wiedenmann of East Moline, Illinois, was chosen winner of the John W. Mardern Prize for 1950. The award is made to the year's outstanding student graduating in chemical engineering from Illinois Wesleyan University, Bloomington, Illinois. It entitles the winner to one year's subscription to the publications of The Electrochemical Society.

Lynn Wiedenmann was born April 21, 1928, at Moline, Illinois, and received his early education at East Moline. He received a B.S. degree from Illinois Wesleyan in June 1950, and is now doing graduate work at the University of Iowa.

Wins Winship Prize

Jack G. Lowenstein was named recipient of the William W. Winship Prize for 1950, entitling him to one year's subscription to The Electrochemical Society publications. This prize is offered each year to the graduating chemical engineering student at Pratt Institute selected for outstanding ability.

Mr. Lowenstein was born in Frankfurt, Germany, attended Stuyvesant High School in New York and served for a year in the U. S. Navy. He did research in his senior year on the electrochemical reduction of organic chemicals which are difficult to reduce by purely chemical means. He is interested in electroplating and depositing, basic electronics, and work in electro-organic synthesis. He resides at 729 West 186th Street, New York, N. Y.

Southwide Chemical Conference, October 16–18

Announcement has been made of a Southwide Chemical Conference to be held in Atlanta, Georgia, on October 16–18, sponsored jointly by the American Chemical Society and the Southern Association of Science and Industry. The meeting, which will attract more than 500 leading industrialists and scientists, is the largest ever held in the area and strikingly points up the South's accelerated progress in all fields of chemistry.

SASI Vice-President Charles R. Younts, commenting on the increasing interest in chemical sciences in the South, cited the great oil and gas industries, the large chemical fertilizer installations, new synthetic fabric plants, paper and pulp mills, and food preserving industries.

The American Chemical Society has more than 20 local groups in the South of which the Georgia Section is serving as host for the October conference.

Among the nationally-known scientific and business leaders who will appear on the program are E. H. Volwiler, National President of ACS; Leland I. Doan, President of The Dow Chemical Company, Midland, Michigan; and Sidney D. Kirkpatrick, Editorial Director, *Chemical Engineering*, New York City; also Dr. W. F. Libby of the University of Chicago, and Dr. C. C. Price of Notre Dame University.

In addition to the technical sessions there will be a chemical industries session occupying one full day, with comprehensive reports on the plastics industries, petroleum, food and drink industries, and the development of new chemical products from Southern raw materials.

Further information, including the complete program, data on reservations, etc. may be obtained from SASI Headquarters, 5009 Peachtree Road, Atlanta, Ga.

Scientific Glass Now in Larger Quarters

Scientific Glass Apparatus Company, Incorporated, announced recently the removal of its offices and plant to its new large headquarters at 100 Lakewood Terrace, Bloomfield, New Jersey, about one-half mile from its former address.

To meet the steadily increasing demand for laboratory apparatus, instruments, and glassware, the company purchased the huge plant of the Clark Thread Company and laid out the extensive floor space for production at one end and for complete stocks of chemicals and apparatus at the opposite end. An equal area on the lower level provides storage room. In addition to the greater manufacturing space the company also has enlarged and expedited its shipping and handling facilities.

DIVISION NEWS

ELECTRODEPOSITION DIVISION

The Nominating Committee of the Electrodeposition Division, composed of Charles B. Sanborn, Harry V. Pochapsky, and Leon R. Westbrook, has announced the following candidates for office for the coming year:

Chairman—R. A. Woofter
Vice-Chairman—M. L. Holt
Secretary-Treasurer—Cloyd A. Snavely
Member-at-Large of the Executive Committee—Abner Brenner

The election of officers will be held at the Electrodeposition Division's luncheon, which will take place at the Buffalo Meeting of the Society, Friday, October 13th.

PERSONALS

JOHN J. NAUGHTON, recently of the Department of Chemistry at the University of Hawaii, Honolulu, is now at the Frick Chemical Laboratory, Princeton University, Princeton, New Jersey.

JAMES W. LUCAS has been appointed superintendent of Victor Chemical Works' Mt. Pleasant, Tennessee, plant. Mr. Lucas joined the company in 1936

A.H.T. CO. SPECIFICATION

ELECTROGRAPHIC KIT

A simple, portable outfit for rapid identification of colorless metals as found in platings, polished or corroded metal surfaces, etc.

4776-A.

As described by D. R. Evans and A. Lewis, Western Electric Company, in a paper presented at A.S.T.M. Annual Meeting, Atlantic City, Week of June 27th, 1949

PORTABLE ELECTROGRAPHIC KIT, A.H.T. Co. Specification. A simple, easy-to-use outfit for rapid identification of metallic elements in metals, alloys or surface platings, for indicating their distribution and location in minerals, tissues, etc., and for identification of chlorides in corrosion products, paper, etc., by means of anodic solution and deposition on a suitable carrier, such as paper.

Tests can be made within the kit on platform A or, if necessary to work at a distance up to 4 ft., on platform B. Tests require less than a minute, irrespective of the shape, color or surface condition of the sample. A sheet of test paper is moistened with a few drops of the electrolyte and placed on the platform which is the cathode. The serrated clip of the lead wire is connected to the sample, which becomes the anode, and contact made to complete the electrical circuit. The sample is dissolved in approx. 20 seconds, test paper removed and reagent added. The color developed indicates the metal present. Suitable for cadmium, chromium, lead, nickel, silver, tin, zinc, and chlorides.

4776-A. Electrographic Kit, Portable, A.H.T. Co. Specification, as above described, complete with detailed directions for use **35.00**

More detailed information sent upon request.

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and in 1949 was made assistant superintendent of the Mt. Pleasant plant. FLOYD B. MCCOY, general superintendent of the company's phosphate plants at Tarpon Springs, Florida, and Mt. Pleasant, has been assigned additional duties relative to Victor's new plant at Silver Bow, Montana.

AXEL LUNDBYE, formerly located at Buffalo, New York, has accepted a position as research engineer with the Kable Printing Company in Mount Morris, Illinois.

GEORGE O. TWELLMEYER, S.J., who had been working for his doctorate at Columbia University during the past year, is now on the teaching staff, in the Chemistry Department, of Spring Hill College, Spring Hill, Alabama.

DONALD M. WROUGHTON has been made Manager of Chemistry Research at the Atomic Power Division of the Westinghouse Electric Corporation in Pittsburgh, Pennsylvania. Dr. Wroughton was formerly Section Engineer in the Research Department of the Westinghouse Lamp Division, Bloomfield, New Jersey.

NEW MEMBERS

In August, 1950, the following were elected to membership in The Electrochemical Society.

Active Members

JOAB AUERBACH, Bator Battery Works, mailing add: P.O. Box 5054, Tel Aviv, Israel (Battery)

CARL W. BORGMANN, University of Nebraska, Lincoln, Nebraska (Corrosion)

JAMES W. CASTEN, Buflovak Equipment, mailing add: 1543 Fillmore Avenue, Buffalo 11, New York (Industrial Electrolytic)

D. T. FERRELL, JR., Naval Ordnance Laboratory, mailing add: 3402 19th Street, N.W., Washington 10, D.C. (Battery and Theoretical Electrochemistry)

JOHN C. GRIESS, JR., Oak Ridge National Laboratory, mailing add: 113 Fulton Lane, Oak Ridge, Tennessee (Electrodeposition and Theoretical Electrochemistry)

LAWRENCE D. HOWER, JR., School of Ceramics, Rutgers University, New Brunswick, New Jersey (Electrothermic)

CLARENCE H. Kruse, The Dow Chemical Company, mailing add: 116 Livingston Court, Midland, Michigan (Industrial Electrolytic)

FRANCES S. LANG, New York University, mailing add: 204½ West 13th Street, New York, New York (Corrosion)

ALBERT K. LEVINE, Sylvania Electric Products Inc., mailing add: 1991 Boulevard, Jersey City 5, New Jersey (Electronics and Theoretical Electrochemistry)

LESLIE D. MCGRAW, Battelle Memorial Institute, mailing add: 602 E. Beechwold Blvd., Columbus, Ohio

DAVID S. MCKINNEY, Chemistry Department, Carnegie Institute of Technology, Pittsburgh 13, Pennsylvania (Corrosion and Theoretical Electrochemistry)

CONSTANTINO J. REGALBUTO, General Electric Company, mailing add: 4338 West Anderson, South Euclid 21, Ohio (Theoretical Electrochemistry)

N. SUBRAMANYAN, The Mettur Chemical & Industrial Corporation, Ltd., Mettur Dam, R. S., South India (Industrial Electrolytic)

ANDOR YEHUDA, Palestine Electric Corporation, mailing add: Antebi str. 8, Tel Aviv, Israel (Corrosion and Electrodeposition)

Reinstatements

SHIRO MATSUNO, Yuasa Dry Battery Company, Ltd., No. 607, Kamitanabe, Takatsuki-shi, Osaka-fu, Japan (Battery)

DENNIS R. TURNER, Westinghouse Research Laboratories, East Pittsburgh, Pennsylvania (Electrodeposition, Electronics, and Theoretical Electrochemistry)

Associate Members

WILLIAM J. COLLINS, Research Laboratory, Corning Glass Works, Corning, New York (Electrodeposition)

BERNARD J. STURM, Burgess Battery Company, mailing add: 206 South Galena Avenue, Freeport, Illinois (Battery, Corrosion, Electrodeposition, and Theoretical Electrochemistry)

FROM THE PUBLISHERS

A GERMAN-ENGLISH DICTIONARY FOR CHEMISTS by Austin M. Patterson. Third Edition. Published by John Wiley & Sons, Inc., New York, 1950. 541 plus vii pages, $5.00.

Chemists will welcome this new edition of a work which has long been widely used. Many new words have been added, bringing the total to 59,000, some of the larger additions being in the fields of chemical technology, atomic structure, electronics, and warfare. Additional meanings have been given for many of the terms listed in the earlier editions.

Following his earlier practice, Dr. Patterson has included a large number of general words, with special attention to their occasional technical meanings.

Although intended primarily for chemists and chemical engineers, the volume contains many words from related fields of science and hence should be useful also to physicists, biologists, geologists, etc.

LETTER TO THE EDITOR

Apologies to Dr. Neman

Dear Sir:

I demand that you forthwith offer your most abject apology to that eminent scientist, Dr. Sol Neman, so that we may not be deprived of his priceless knowledge of the history of our great pioneers in Electricity and Electrochemistry!

James T. MacKenzie
Birmingham, Alabama

RECENT PATENTS

* Selected for electrochemists by Fred. W. Dodson, Chairman of the Patent Committee, from the Official Gazette.

May 16, 1950

Fagen, W. F., 2,508,238, Gaseous Acid Anhydride Detection Apparatus

May 23, 1950

Greider, C. E., 2,508,455, High-Intensity Carbon Electrode

Krebs, E., 2,508,523, Device for the Protection of the Cathodes of Electrolytic Cells

Scott, W. J., 2,508,691, Method of Manufacturing Prototypes

Wallace, E. H., 2,509,117, Method of Making Composite Wire

May 30, 1950

Clark, F. M., Application 601,361, Electric Capacitors

Hardin, S. A., 2,509,228, Electric Furnace for Phosphate Reduction

Mattheyses, M. J., 2,509,239, Battery-Charging System

Rhodes, H. E., 2,509,249, Alkaline Primary Cell

Salazar, A. M., 2,509,252, Battery-Charging System

Gray, R., and Jones, H. C., 2,509,298, Terminal Arrangement for Compound-Sealed Posts

Jellinek, M., 2,509,303, Continuous Method and Apparatus for Determining Water in Non-Electrolytes

Klein, C. J., 2,509,304, Method and Apparatus for Electrolytic Coating of Strip Material

Hedding, L. K., and Zierdt, C. H., 2,509,342, Electrical Rectifier Construction

Lunt, R. L., 2,509,689, Apparatus for the Separation of Acid and Metal

Stainer, A., 2,509,702, Cathode for Thermionic Valves

Carl, W. F., 2,509,722, Mold or Case Holder for Use in Electrotyping

Schiermeier, K. F., and Poitz, H. A., 2,509,786, Corrosion Preventive Compositions

Keyser, A. H., 2,509,825, Heat Sensitive Device

Oswald, M., 2,509,838, Manufacture of Tungsten and Molybdenum Carbides and Sintered Alloys

Griffith, D. L., and Rankin, M. J., 2,509,916, Method of Removing Nickel and Cobalt Impurities from Zinc Electrolyte Solutions; 2,509,917, Method of Removing Nickel and Cobalt Impurities from Zinc Electrolyte Solutions; 2,509,918, Method of Removing Nickel and Cobalt Impurities from Zinc Electrolyte Solutions

NOTES FROM INDUSTRY

Personalities

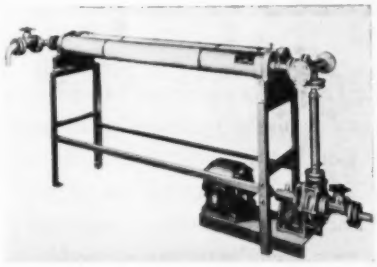
MATHIESON CHEMICAL CORPORATION of Niagara Falls has appointed Joseph E. Baker vice-president, general manager of Niagara Falls operations. He succeeds F. Boynton Butler, general manager since 1940, who is retiring. Also, W. A. Karre has been promoted to general superintendent of the Niagara Falls operations of Mathieson.

MONSANTO CHEMICAL COMPANY, St. Louis, has appointed HOWARD K. NASON of Dayton assistant to Dr. C. A. Hochwalt, Vice-President and Co-ordinator of Research, Development and Patent activities of the company. DR. NICHOLAS N. T. SAMARAS, of Springfield, Mass., succeeded Mr. Nason as Director of the Central Research Department at Dayton. HAROLD W. MOHRMAN of Springfield was named to succeed Dr. Samaras as Research Director of the company's Plastics Division. ERWIN G. SOMOGYI of Springfield was named Associate Director of Research of the Plastics Division.

MELVIN L. BUNTING has been appointed a Technical Service Engineer of Acheson Colloids Corporation, Port Huron, Mich. His duties will include engineering assistance to customers and new applications research. Mr. Bunting was previously connected with the U. S. Gypsum Company in Detroit.

Products

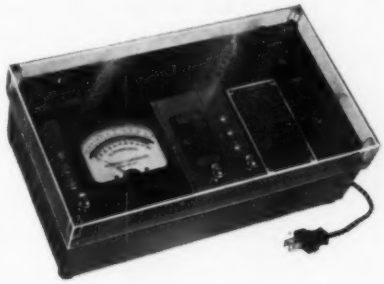
INDUSTRIAL FILTER AND PUMP MANUFACTURING COMPANY of Chicago has introduced a new line of unit heat exchangers for plating solutions. The design and construction of the new equipment permit the use of the same unit for both heating and cooling the



solution as operating conditions require, using pure nickel tubes for nickel solutions, steel and special alloy tubes for other applications. The heat exchangers can be furnished as a unit with a combination of from one to six tubes in multiple for a wide variety of heat exchange capacity. Special units, complete with pump and stand, are readily engineered for unusual capacity or space requirements. They are easily connected to the plating system, and can be located anywhere that is convenient.

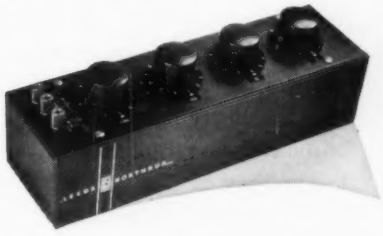
LANCO STAINLESS STEEL BEAKERS, with pouring lip, have been designed by Arthur S. La Pine & Company, Chicago, to give the utmost in functional service throughout the laboratory. These beakers are strong and durable and highly resistant to most reagents. The lip forms a steady, firm flow—with no after-drip. All sizes from 50 ml to 4000 ml.

PHOTOVOLT CORPORATION, 95 Madison Avenue, New York, is offering its new Lumetron Photoelectric Colorimeter Model 401, designed for the practical requirements of colorimetric measurements on liquids and solutions in



analytical laboratories, production control work, and educational institutes. The Colorimeter is fast, accurate, and easy to use; has built-in stabilizer of high efficiency, is enclosed in rigid metal housing with plexiglas cover. For full details, send for Photovolt Bulletin #406.

LEEDS & NORTHRUP COMPANY, Philadelphia, Pa., has just announced the new A-C Resistance Boxes, designed for use as moderate-precision, adjustable standards for d-c and for a-c resistance measurements up to medium frequencies. The principal feature is a new



type of rotary switch having a very low and stable contact resistance, obtained through the use of solid silver switch contacts and silver alloy multiple-leaf brushes. The boxes accommodate various plugs; current rating for each decade is engraved on the nameplate. Further information available upon request.

HANSON-VAN WINKLE-MUNNING COMPANY, Matawan, N. J., has developed a Mercil Type Merlon ribless cylinder, in 14 x 30 inch size for use with all commonly employed plating solutions. This cylinder will hold 15 per cent more work than the usual plating cylinder of the same overall size. The model is hexagon in shape; it has no ribs, no tie rods, and no tie rod tubing. Maintenance costs are less because of simplified construction with fewer parts to be replaced.

MEMBERS:

. . . . A Convention Cruise?

Members who enjoy Electrochemical Society meetings will be interested to learn that, in response to many requests, tentative plans are being made to combine the Fall 1952 Convention in Montreal with a cruise on the famous Saguenay River. As an added attraction to the technical sessions and entertainment aboard ship, there will be stopovers at unusual points of interest along the way, including a day at Arvida, center of the largest electrochemical operation in the world.

Preliminary figures from the Canada Steamship Lines set the cost for the complete trip, including all meals, at $65.00, which is little more than you pay for hotel and meals when attending a meeting in any large city. The boat will leave Montreal at 7 P.M. EST, Wednesday, September 24, 1952, and return to Montreal at 6 A.M. Sunday, September 28.

Your help is needed before the cruise can be scheduled. Arrangements must be made in the near future to reserve a ship for the exclusive use of the Society, but before final commitments are made, we must have assurance from the members that the meeting will be well attended.

The Board of Directors has requested that those who plan to take the trip make a deposit of $25.00 so that an estimate may be made of the number who will attend. It will be necessary to have 300 reservations by December 1, 1950. If there is insufficient response, the trip will not be scheduled and the deposit will be returned.

If you would like to take this cruise, please send your deposit *promptly*, together with any suggestions you may have, to the Secretary of the Society, Dr. Henry B. Linford. The address is 235 West 102nd Street, New York 25, N. Y.

Thanks for helping us plan this 102nd Convention!

FUTURE MEETINGS OF OTHER ORGANIZATIONS

National Electrical Contractors Association, annual convention, Hotel Biltmore, Los Angeles, California, October 17–20

AIEE Fall General Meeting, Skirvin Hotel, Oklahoma City, Oklahoma, October 23–27

Eighth Annual Pittsburgh Conference on X-Ray and Electron Diffraction, Mellon Institute for Industrial Research, Pittsburgh, Pennsylvania, November 2–3

ASME Annual Meeting, Hotel Statler, New York City, November 26–December 1

American Standards Association, Annual Meeting, Waldorf-Astoria, New York City, November 27–29

EMPLOYMENT SITUATIONS

Please address replies to box shown c/o The Electrochemical Society Inc., 235 West 102nd Street, New York 25, N. Y.

Position Available

Anode Salesman, or man adaptable to sales, with chlorine cell experience, 30 to 50 years old. An outstanding opportunity to grow with a newcomer in the field. *Reply to Box A-218.*

Positions Wanted

Electrochemist, M.Sc., experienced mainly in batteries and allied fields with responsible positions in research development, product engineering, production engineering, sales engineering, and administration. Publications and patents. Desires position of responsibility in development manufacturing or sales engineering. Available on one month notice. *Reply to Box 341.*

Chemical Engineer, 31, B.S., W.P.I., three years' experience in electric reduction furnace operation and six years' electroplating in the electronic industry. Extensive background in all phases of metal finishing including industrial engineering aspects. Good appreciation of problems involved and teamwork required in design, plant layout, operation, maintenance, and quality control. Desires a responsible position in engineering or production development. *Reply to Box 342.*